



**OSU Testing Center**  
 101 UAT Building, (405) 744-5958  
 testing.center@okstate.edu  
 http://testing.okstate.edu/

OSU Testing Center Use Only:			Station #	
Test Date:	7/21	Initial:		ND
Time Started:	3:30 PM	Initial:		ND
Time Finished:	4:25 PM	Initial:	ND	

**INSTRUCTOR:** In order to have your test proctored to your specifications, please complete ALL the following fields after visiting with your student and submit this form with your test. Forms and tests should be dropped off in 100 UAT Building or emailed to testing.center@okstate.edu at least 24 hours in advance of the student's appointment. The OSU Testing Center provides accommodations for students with disabilities. Student Disability Services (SDS) notifies instructors regarding testing accommodations for students in their courses. If you have questions or concerns about student accommodations, please contact the SDS office at 405-744-7116.

**PLEASE NOTE:** Submission of this form does NOT create an appointment for the student. Students MUST schedule their own appointments (at least 24 hours in advance, recommended 1 week in advance) to take a test at the OSU Testing Center.

### STUDENT(S), INSTRUCTOR, & TEST DETAILS

Exam Type: ☐ Student Disability Services (SDS) Exam ☐ OSU Course Exam (non-SDS) ☒ Other Institution Exam

Student Name(s): See attached email for list of names

Instructor Name: Terry Collins

Other Institution Name: OSU

Instructor Phone: 405-744-6055

Instructor Email: terry.collins@okstate.edu

Course Name: Engineering Economic Analysis

Department Phone: x45148

Course Prefix/Number: IEM 3503/3513

Test/Exam Title: Test 5 - Test 10

Is the Test ☒ Paper-Based or ☐ Online?

Test Date (as arranged with student): 7/13/17 8:00 a.m.

Is Test Date flexible? ☒ Yes ☐ No

Test Time (as arranged with student): 7/17/17 8:00 p.m.

Is Test Time flexible? ☒ Yes ☐ No

Class Time allowed for test: \_\_\_\_\_ Hour(s) and 75 Minutes

The OSU Testing Center will calculate accommodation time for SDS students based on instructions provided by Student Disability Services.

### TEST ADMINISTRATION INSTRUCTIONS

#### Testing materials required/allowed by the instructor:

- |   |   |  |  |
|---|---|--|--|
| <input checked="" type="checkbox"/> Notes       | <input type="checkbox"/> Orange Scantron              | <input type="checkbox"/> Graphing Calculator     | <input type="checkbox"/> English Dictionary  |
| <input checked="" type="checkbox"/> Textbook(s) | <input type="checkbox"/> Green Scantron               | <input type="checkbox"/> Non-graphing Calculator | <input type="checkbox"/> Language Dictionary |
| <input type="checkbox"/> Scratch Paper          | <input checked="" type="checkbox"/> Mechanical Pencil | <input type="checkbox"/> Computer Use            | <input type="checkbox"/> LockDown Browser    |
| <input type="checkbox"/> Blue Book              | <input type="checkbox"/> Highlighters                 | <input type="checkbox"/> Ruler/Straight Edge     | <input type="checkbox"/> Colored Pencils     |

#### Additional Instructions, Directions, Requirements, Passcodes, or Other Information:

Open book, one page of notes 8 1/2 X 11, attach notes to test when submitted for grade.  
 No cell phones or back packs in testing area. See test for complete instructions.

**Please Note:** If special software is required, software and detailed installation instructions must be submitted to the OSU Testing Center at least a week in advance, and the OSU Testing Center reserves the right to not test a student if the software cannot be installed, operated, and removed easily.

### TEST RETURN INSTRUCTIONS

How do you want the completed test materials returned to you? Please check ONE.

\_\_\_\_\_ Please hold. I will pick up test (must show photo ID).

\_\_\_\_\_ I have authorized \_\_\_\_\_ to pick up the test (must show photo ID).

☒ Deliver test within 72 hours to 101 EN (Bldg/Rm) OR departmental office \_\_\_\_\_ (Bldg/Rm).  
**NOTE:** If the OSU Testing Center is unsuccessful in delivering a test to an instructor's office and no departmental office is provided, the test will be held at 100 UAT Building for pick-up by the instructor.

**Tests not administered will be retained for two weeks after the end of the semester and then destroyed.**

Received by Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Print Name: \_\_\_\_\_

### Statement of Academic Honesty

The following form is standard procedure for an exam that may be offered multiple times. Read the material below, then complete the form and return it with your completed exam. Your exam will not be graded unless a completed copy of this form is on file.

Course: IEM 3503/3513 Summer 2017

Test: Weekly Test # 6

There are others who may be taking this exam or a similar exam at a later date. You are in no way to have any form of direct or indirect communications regarding this exam with anyone. If someone asks something as simple as "How was it?" your best response is "I cannot talk about the exam." Any violation of the letter or spirit of the above will be treated as an act of academic dishonesty.

By completing the information below, I acknowledge that I have read and understood the Statement of Academic Honesty above.

Name (signature)

(b)(6), (b)(7)(c), (b)(7)(f)

Name (print):

(b)(6), (b)(7)(c), (b)(7)(f)

Student ID:

(b)(6), (b)(7)(c), (b)(7)(f)

Today's Date:

7/21/17

NAME: \_\_\_\_\_

(b)(6), (b)(7)(c), (b)(7)(f)

**DR. B. COLLINS****TEST #6 (ON-LINE SECTION ONLY)****TIME LIMIT: 75 MINUTES****TEST TIME WINDOW: THURSDAY, JULY 20, 2017 (8:00AM) TO MONDAY  
JULY 24, 2017 (5:00PM)****(OPEN BOOK, ONE PAGE OF NOTES – 8 ½ X 11)****Attach Notes Page to back of Test when submitted for grade****ABSOLUTELY NO CELL PHONES OR BACKPACKS IN TESTING AREA!!!**

**Multiple Choice Questions: For each Multiple Choice question below select the most nearest answer from choices A – D. Properly write your selected answer in the blank beside the corresponding question. Each M/C question is worth 10 points each.**

**A digitally controlled plane for manufacturing furniture is purchased at the Kertz Shutter Mill Company for \$120,000. It is expected to last 10 years, and have a salvage value of \$12,000. MARR is 10%/yr.**

**Using the information above to answer questions 1 – 4 below:**

- (10) A 1. Using the Straight-Line Depreciation method, what is the depreciation for year 10 ( $d_{10}$ )?

A. \$10,800  
B. \$ 9,166  
C. \$ 8,432  
D. \$ 6,555

$$d_{10} = \frac{P - F}{n} = \frac{120000 - 12000}{10} = 10800$$

- (10) D 2. Using the Straight-Line Depreciation method, what is the accumulated depreciation for year 9 ( $Ad_9$ )?

A. \$64,150  
B. \$73,330  
C. \$85,500  
D. \$97,200

$$d_9 = \frac{120000 - 12000}{9} = 12000$$

$$10800(9) = 97200$$

$$B_t = P - t d = P - t(P - F)/n$$

- (10) B 3. Using the Straight-Line Depreciation Method, what is the book value for year 10 ( $B_{10}$ )?
- A. \$ 10,000  
 B. \$ 12,000  
 C. \$ 18,333  
 D. \$120,000

$$B_{10} = 120000 - 10(10800) = \underline{12000}$$

- (10) C 4. Using the Straight-Line Depreciation Method, what is the book value for year 6 ( $B_6$ )?
- A. \$74,150  
 B. \$65,000  
 C. \$55,500  
 D. \$42,500

$$d_6 = \frac{120000 - 12000}{6} = \underline{18000}$$

$$B_6 = 120000 - 6(18000)$$

$$B_6 = 120000 - 6(10800) = \underline{55200}$$

Two capital projects for a scissor-lift load leveler at the new OSU CEAT Cooper Research Laboratory are under consideration. Using an interest rate of 8% answer questions 5 through 7 below using one of the Equivalent Uniform Annual Cost (EUAC) methods. You may assume identical replacement (same cost, performance, etc.)

	Project A	Project B
P- Initial Cost	\$25,000	\$33,000
F- Salvage Value, End of life	\$5,000	\$2,800
n- Useful life, years	6	3

- (10) B 5. What is the Equivalent Uniform Annual Cost for Project A?

- A. \$5,250  
 B. \$4,750  
 C. \$3,430  
 D. \$2,160

$$\begin{aligned} EUAC &= P(A|P, i, n) - F(A|F, i, n) \\ &= 25000(A|P, 8\%, 6) - 5000(A|F, 8\%, 6) \\ &= 25000(.21632) - 5000(.13632) \\ &\approx \underline{4726.4} \end{aligned}$$

- (10) D 6. What is the Equivalent Uniform Annual Cost for Project B?

- A. \$ 6,160  
 B. \$ 7,420  
 C. \$ 8,750  
 D. \$11,950

$$\begin{aligned} &33000(.38803) - 2800(.30803) \\ &\approx \underline{11942.5} \end{aligned}$$

- (10) A 7. Based on your selected answers above using one of the EUAC methods which project should be selected?
- A. Project A
  - B. Project B
  - C. Both projects are equal so you are indifferent
  - D. Not enough information to answer the question

The Bunge Grain Company purchases a U-trough paddle conveyance system used in the transportation of grain crops to and from the crimping, grinding, and milling machines. The conveyance system costs \$70,000 with a market value for salvage purposes that decreases at a rate of 20% per year down to a minimum of \$3,000. Operation and maintenance is expected to cost \$14,000 in the first year, increasing by \$1,000 per year thereafter. Bunge uses a MARR of 15%

$P = 70,000$   
 $F_{min} = 3000$

Using the information above answer questions 8-10 below:

- (10) A 8. What is the Equivalent Uniform Annual Cost (EUAC) for Year 4?
- A. \$37,200
  - B. \$36,600
  - C. \$34,100
  - D. \$32,500
- $70000(A/P, 15\%, 4) - 3000(A/F, 15\%, 4) + 14000$   
 $.35027 \quad .20027 \quad + 14000$   
 $= 37918.1$

- (10) B 9. What is the Capital Recovery (CR) cost for Year 8?
- A. \$18,750
  - B. \$16,400
  - C. \$14,750
  - D. \$13,575
- $70000(A/P, 15\%, 8) - 3000(A/F, 15\%, 8) = 15381$   
 $.22285 \quad .07285$

- (10) C 10. What is the Equivalent Uniform Annual Cost (EUAC) for Year 7?
- A. \$33,200
  - B. \$31,950
  - C. \$32,500
  - D. \$33,200
- $.24036 \quad .09036 \quad 16554.1$

(SCRATCH PAGE, LEFT BLANK INTENTIONALLY)

70000 1 ~  
-14000

no notes page //

SCORE: \_\_\_\_\_